



Atty. Dkt. No. 040302-0343

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A manufacturing method of an endless metal belt having metal rings built up and differing in circumference, comprising the steps of:
  - a first circumference correction step of expanding each of the metal rings;
  - a solution heat treatment step; and
  - a second circumference correction step of expanding each of the metal rings after conducting a solution heat treatment to the expanded metal ring, wherein
    - by executing the first circumference correction step and the second circumference correction step before and after the solution heat treatment, respectively, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained.
2. (Previously Presented) The manufacturing method of an endless metal belt according to claim 1, wherein an expansion quantity attained in the first circumference correction step is corrected to correspond to a circumference set to each of the metal rings differing in circumference.
3. (Original) The manufacturing method of an endless metal belt according to claim 1, wherein the manufacturing method further comprises a rolling step of forming each of the metal rings input in the first circumference correction step by rolling.
4. (Previously Presented) The manufacturing method of an endless metal belt according to claim 1, wherein:
  - each of the metal rings is input between a work roller and a tension roller in the rolling step;
  - a tension is applied to each of the metal rings by moving the tension roller in the rolling step;
  - each of the metal rings is rolled by moving a rolling roller to press the rolling roller against the metal ring in the rolling step;

the tension roller and the rolling roller are servo-controlled;

based on one of operation patterns of the tension roller and the rolling roller, the other operation pattern is changed.

5. (Previously Presented) The manufacturing method of an endless metal belt according to claim 1, wherein a work roller and a rolling roller are set to have an equal circumferential speed.

6. (Previously Presented) The manufacturing method of an endless metal belt according to claim 1, wherein:

each of the metal rings is input between a work roller and a tension roller in the first and the second circumference correction steps; and

each of the metal rings is expanded by moving the tension roller until the circumference of each of the metal rings becomes a set circumference of each of the metal rings becomes a set circumference in the first and the second circumference correction steps.

7. (Original) The manufacturing method of an endless metal belt according to claim 1, further comprising the step of:

measuring the circumference of each of the metal rings before the second circumference correction step.

8. (Previously Presented) The manufacturing method of an endless metal belt according to claim 7, wherein:

based on a moving length of a tension roller necessary to apply a predetermined tension to each of the metal rings input between a work roller and the tension roller, the circumference of each of the metal rings is measured, in the circumference measurement step; and

movement of the tension roller is controlled based on a combination of pressure control and position control.

9. (Currently Amended) A manufacturing apparatus of an endless metal belt having metal rings built up and differing in circumference, comprising:

a machine to perform a first circumference correction on one of the metal rings ~~under non-rolling working~~ and a second circumference correction on the metal ring, wherein the first circumference correction and the second circumference correction expand the metal ring; and

a heat treatment device to perform a solution heat treatment on the metal ring; wherein the machine to perform the first circumference correction and the second circumference correction is adapted to perform the second circumference correction after a solution heat treatment has been performed by the heat treatment device;

wherein the machine comprises:

a work roller and a tension roller that are configured to perform circumference correction on the metal ring when the metal ring is placed around the circumferences of the work roller and the tension roller;

a first driver configured to drive the work roller so as to rotate the work roller;  
a second driver configured to apply a tension to the metal ring;  
a rolling roller configured to perform a rolling step on the metal ring, wherein the rolling roller is configured to rotatably sandwich the metal ring between the work roller and the rolling roller;

a third driver configured to drive the rolling roller so as to rotate the rolling roller; and

a fourth driver configured to move the rolling roller against the work roller so as to press the metal ring, wherein the fourth driver is configured to move the rolling roller in a direction away from the work roller and the metal ring;

wherein the work roller and the rolling roller are driven by the first and third drivers to rotate synchronously with each other.

10. (Previously Presented) The manufacturing apparatus of an endless metal belt according to claim 9,

wherein by using the machine to perform the first circumference correction and the second circumference correction before and after the solution heat treatment, respectively, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained;

wherein the expansion quantity attained by the first circumference correction is corrected to correspond to the circumference set to each of the metal rings differing in circumferences.

Claims 11-12. (Canceled)

13. (Currently Amended) The manufacturing apparatus of an endless metal belt according to claim 9, wherein the [[a]] work roller and the [[a]] rolling roller are set to have an equal circumferential speed.

14. (Canceled)

15. (Original) The manufacturing apparatus of an endless metal belt according to claim 9, further comprising:

a circumference measurement section measuring the circumference of each of the metal rings.

16. (Currently Amended) The manufacturing apparatus of an endless metal belt according to claim 15, wherein:

the circumference measurement section measures the circumference of each of the metal rings input between the [[a]] work roller and the [[a]] tension roller based on a moving length of the tension roller necessary to apply a predetermined tension to each of the metal rings; and

movement of the tension roller is controlled based on a combination of pressure control and position control.

17. (Currently Amended) A manufacturing apparatus of an endless metal belt having metal rings built up and differing in circumference, comprising:

a means for performing a first circumference correction on one of the metal rings ~~under non-rolling working~~ and a second circumference correction on the metal ring, wherein the first circumference correction and the second circumference correction expand the metal ring; and

a means for performing a solution heat treatment on the metal ring;

wherein the means for performing the first circumference correction and the second circumference correction is adapted to perform the second circumference correction after a solution heat treatment has been performed so that an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained;

wherein the means for performing the first circumference correction and the second circumference correction comprises:

a work roller and a tension roller that are configured to perform the circumference correction on the metal ring when the metal ring is placed around the circumferences of the work roller and the tension roller;

a first driver configured to drive the work roller so as to rotate the work roller;

a second driver configured to apply a tension to the metal ring;

a rolling roller configured to perform a rolling step on the metal ring, wherein the rolling roller is configured to rotatably sandwich the metal ring between the work roller and the rolling roller;

a third driver configured to drive the rolling roller so as to rotate the rolling roller; and

a fourth driver configured to move the rolling roller against the work roller so as to press the metal ring, wherein the fourth driver is configured to move the rolling roller in a direction away from the work roller and the metal ring;

wherein the work roller and the rolling roller are driven by the first and third drivers to rotate synchronously with each other.

18. (Previously Presented) The manufacturing apparatus of an endless metal belt according to claim 17, wherein by using the means for performing a first circumference correction on the metal belt and a second circumference correction before and after the solution heat treatment, to perform a first circumference correction before the solution heat treatment and a second circumference correction after the solution heat treatment, an expansion quantity for setting a circumference of each of the metal rings to become a predetermined length is attained.

Claims 19-20. (Cancelled)

21. (New) The manufacturing apparatus of an endless metal belt according to claim 9,  
wherein the machine comprises:

    a first scale that is configured to detect a moving length of the tension roller;  
    and

    a second scale that is configured to detect a moving length of the rolling roller,  
    wherein the second scale is configured to feed the detected moving length back to the  
    fourth driver.